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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/664,363 | 09/18/2000 | Peter Edmund Highfield | 2035-38 | 3939 |

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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
|---|---|
| 1648 | |

DATE MAILED: 11/27/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/664,363 | HIGHFIELD ET AL. | |
| | Examiner | Art Unit | |
| | Bao Qun Li | 1648 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 September 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *1-8 and 14-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *08/191,160* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

Claims 1-20 are pending.

Alternate Petition under Rule 181 is acknowledged and has been forwarded to the authorized Office for consideration. A proper response will be send out by the special officer therein.

### *Election/Restrictions*

Applicant's election with traverse of Group III, claims 9-13 in the scope of SEQ. ID. NO. 21 in Paper No. 5 is acknowledged. The traversal is on the ground(s) that restriction to a single separately and distinctly sequence places burden on Applicants according to the Commissioner's Notice of November 19, 1996. This is not found persuasive because the claimed sequence exhibits different structure as evidenced by the sequence search of SEQ ID NO: 21 showing no homology found to any other claimed sequence ID NO: 3-5, 18-20 and 22. Therefore, each of sequences constitutes a distinctive invention. Furthermore, the searching for each elected sequence profile is not only limited to only one sequence but including all limitation complied with it. For instant, Applicants are required to elect one sequence; the real sequence searching has to be conducted with any sequence having at lease 90% homology to the elected one, which causes a significant time consuming both in house and commercial data base due to the great increase of the gene discoveries in the recent years. The source for searching different sequences is rather limited; therefore, it constitutes a serious burden for examiner to conduct several structurally different polypeptide or polynucleotide sequence searching for one prosecution.

The requirement is still deemed proper and is therefore made FINAL.

Claims 9-13 are examined within the scope of SEQ ID. NO: 21 for the merit.

Applicants are required to amend the claims 9-13 for reflecting the office action on the merits and cancel the claim 1-8 and 14-20 to the non-elected group.

### *Title*

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: PT-NANB HEPATITIS POLYNUCLEOTIDES.

***Information disclosure***

The information disclosure statement filed 09/18/00 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because certain references (Attachment A and Attachment B) are missing. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

***Priority***

This application filed under former 37 CFR 1.60 lacks the necessary reference to the prior application. A statement reading "This is a Continuation of Application No. 08/191,160, filed o2/03/1994, which is a continuation of Applicantion No. 07/628,516, should be entered following the title of the invention or as the first sentence of the specification. Also, the current status of all nonprovisional parent applications referenced should be included.

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 08/191,160, filed on 02/03/1994.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim. The unclearness is because the claim is interpreted in according to any one of claims 1-8. The claims 1-8 require a "percentage homology" to particular SEQ ID NO's; thus, claim 9 is

interpreted as a DNA sequence having at least 90% homology to SEQ ID NO: 21 or an antigen fragment. This language is vague and indefinite in that the word "having" is an open language and "at least" is a relative word. Furthermore, applicants are reminded that the sequence identity, homology or similarity can be calculated by a variety of different methods, whereby the calculated identity between two sequences will be quite different depending on the algorithm used for calculation. Applicant has referred to the various at least 90 % identities, but there are no indication of the utilized algorithm to calculate the identity sequences. Moreover, the calculation of "identity" is affected by variables such as the relative weight given to the sequence gaps versus mismatches, or whether conservative substitutions are weighted differently from non-conservative substitutions. Consequently, the combination of the phrase cannot define the metes and bonds of the claimed sequence of fragment of the sequence because it is unclear for which part of the claimed sequence should be included and excluded. The claims should point out precisely the sequence structure intended in the said claim. This affects the dependent claim 10-13.

Claims 11 and 13 are vague for recitation of a relative word "capable of" because the capability of a compound or composition to perform some function is merely a statement of a latent characteristic of said compound or composition and said language carries no patenable weight. Therefore, the claims are regarded as indefinite.

***Claim Rejections - 35 USC § 112***

Claims 9-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an isolated polynucleotide of HCV encoding SEQ ID NO: 21, does not reasonably provide enablement for having any or all DNA sequence having at least 90% homologous to SEQ ID NO: 21 or any antigen fragment derived from the SEQ ID NO: 21. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected to make and use the invention commensurate in scope with these claims.

The test of scope of the enablement is whether one skilled in the art could make and use the claimed invention from the disclosures in the application coupled with information known in the art would undue experimentation (See United States v. Theketronic Inc., 8USPQ2d 1217 (fed Cir. 1988). Whether undue experimentation is required is not based upon a single factor but

rather a conclusion reached by weighting many factors. Theses factors were outlined in Ex parte Forman, 230 USPQ 546 (Bd. Pat. App. & Inter. 1986) and gain in re Wands, 8USPQ2d 1400 (Fed. Cir. 1988).

Applicants are reminded that field for isolating a stable (non-mutated) PT-NANB hepatitis virus is unpredictable. PT-NANB hepatitis virus is recognized as positive RNA virus, and now it is called hepatitis C virus (HCV). Being an RNA virus, HCV can mutate rapidly and automatically in adapting to the environments, thus contributing to the high genome divergence and quasispecies for multiple isolated viral strains in the world. A single isolated HCV strains even can generate more than a hundred clones in the most genetically heterogeneous region and each clone exhibits different immunogenecityies as described by Lechmann et al. (Sminars in Liver disease, 2000, Vol. 2, pp. 211-226), Lechner et al. (Philos. Trans. R. Soc. Lond. B. Bio Sci. 2000, Vol. 355, pp. `085-1092), and Purcel (Hepatology 1997, Vol. 26, pp. 11S-14S).

In addition, the sequence identity, homology or similarity can be calculated by a variety of different methods as described supra. Applicants present no working example and guidance for how the homology is defined and which region is conserved within the 90% homology.

The claims broadly read on any or all sequence, which exhibit at least 90% homology or any antigen fragment derived from the SEQ ID NO: 21.

However, Applicants only disclose a fragment cDNA of a PT-NANB virus isolate, which is identified as sequence SEQ ID NO: 21. This sequence is identical only as a whole compared to other isolated strains of PT-NANB virus.

In light of the state of the art indicating that the field for isolating a stable non-mutated HCV is very unpredictable. Applicants fail to disclose the encompassed homologous region(s) in SEQ ID NO: 21 and/or a method for determining the conserved homologous region(s). Therefore, it would require a high level of sill in the art to do an extensive non-routine work to full scope of the invention.

Thus, considering large quantity of experimentation needed, the unpredictability of the field, the state of the art, and breadth of the claims, it is concluded that undue experimentation would be required to enable the intended claim. Many of these factors have been summarized *In re Wands, 858 F.2d 731, USPQ2d 1400 (Fed. Cir. 1988).*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 9-13 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In the instant disclosure, the applicants have only disclosed the sequences identified as SEQ ID NO: 21, which is directed to isolated nucleotide fragment of a PT-NANB heptitis virus. No other sequences which having at lease 90% homology to SEQ ID NO: 21 is disclosed. The specification does not set forth the metes and bounds of that encompasses SEQ ID NO: 21, there is not enough information about it in literature either to guide the one of ordinary skill in the art to predict the undisclosed at least 90% homology regions where the region may encompass. Therefore, a written description of the other claimed sequences encoding the 90% homology of SEQ ID NO: 21 should be disclosed to overcome this rejection. See also *University of California v. Eli Lilly and Co.*, 43 USPQ2d 1398 (Fed. Cir. 1997), which teaches that the disclosure of a process for obtaining cDNA from a particular organism and the description of the encoded protein fail to provide an adequate written description of the actual cDNA from that organism which would encode the protein from that organism, despite the disclosure of a cDNA encoding that protein from another organism. 35 USC 112 requires inter alia that "a patent specification contain a written description of the invention and the manner and process of making and using it in such full clear and concise terms as to enable one skilled in the art to make and use the invention". Case law has made it clear that the requirements for a "written description" and an "enabling disclosure" are separate. For example, where a specification contains sufficient information to enable a skilled chemist to produce a particular compound because it gives detailed information on how to produce analogous compounds but it makes no reference to the compound in question, the "written description" requirement has not been met even though the description may be enabling.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 9-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Houghton et al. (EP 0318216A1).

Houghton et al. disclose a purified HCV polynucleotide and a recombinant HCV polynucleotide. They also disclose that the recombinant expression vector system comprising an open reading frame of the DNA derived from the HCV genome or from the HCV cDNA, which is transfected into a host cells to express the recombinant polypeptide of HCV (See entire document and claims 1-18). The claimed sequence(s) from amino acids 308-2116, which stretches out from the structural regions E1 and E2 to non-structural regions Ns2 to part of NS5, is also within the range of the disclosed sequences by Houghton et al (Figs. 46 and 47). Therefore, the claimed invention is anticipated by the cited reference.

***Conclusion***

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bao Qun Li whose telephone number is 703-305-1695. The examiner can normally be reached on 8:00 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Housel can be reached on 703-308-4027. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-4242 for regular communications and 703-308-4242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Bao Qun Li November 19, 2001

ALI R. SALIMI
PRIMARY EXAMINER